

## Claims

What is claimed is:

- [c1] A directory server comprising:
- a supplier server;
  - a consumer server in communication with the supplier server;
  - a plurality of pluggable services that manage replication of data contained within the directory server from the supplier server to the consumer server; and
  - a change log maintained on the consumer server of data replicated to the consumer server;
- wherein replication of data is managed by the plurality of pluggable services using the change log.
- [c2] The directory server of claim 1, further comprising:
- a directory information tree copied between the supplier server and the consumer server;
- wherein replication of data is managed by the plurality of pluggable services using the directory information tree.
- [c3] The directory server of claim 1, further comprising:
- a directory information subtree copied between the supplier server and the consumer server;
- wherein replication of data is managed by the plurality of pluggable services using the directory information subtree.
- [c4] The directory server of claim 2, wherein the plurality of pluggable services comprises a change sequence number service creating a unique combination of numbers used to determine ordering of an update operation for an attribute value in an entry in the directory information tree.

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- [c5] The directory server of claim 1, wherein the plurality of pluggable services comprises an update resolution procedure service determining ordering of operations by comparing a first change sequence number of the supplier server to a second change sequence number of the consumer server.
- [c6] The directory server of claim 1, wherein the plurality of pluggable services comprises a replica update vector service determining a set of updates to be sent to a data replica by consulting a replica update vector for the consumer server.
- [c7] The replication system of claim 6, wherein the replica update vector comprises a change sequence number for every data replica.
- [c8] The directory server of claim 2, wherein the plurality of pluggable services comprises a replication agreement service comprising an entry in the directory information tree describing a relationship between the supplier server and the consumer server.
- [c9] The directory server of claim 1, wherein the plurality of pluggable services comprises a server-initiated replication protocol service to store and update state information.
- [c10] The replication system of claim 9, wherein state information comprises a uniqueid and a plurality of change sequence numbers for an entry.
- [c11] The directory server of claim 1, wherein the plurality of pluggable services comprises an incremental update algorithm service comparing a first replica update vector of the supplier server and a second replica update vector of the consumer server to order an update sequence from the change log.

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FOOTNOTES

- [c12] The directory server of claim 1, wherein the plurality of pluggable services comprises a uniqueid service assigning a unique identifier to an entry added by a client.
- [c13] A method for replicating data in a directory server having a supplier and a consumer server, comprising:  
determining a need to replicate data in the directory server;  
using a plurality of services to manage replication of data contained within the directory server from the supplier server to the consumer server;  
maintaining a change log of data replicated to the consumer server; and  
updating data replicated to the consumer server.
- [c14] The method of claim 13, further comprising:  
resolving conflicts of the replicated data using a time stamp to determine the consumer server holding the most recent version of the replicated data.
- [c15] The method of claim 13, wherein replication of data is managed by the plurality of pluggable services using a directory information tree.
- [c16] The method of claim 13 wherein replication of data is managed by the plurality of pluggable services using a directory information subtree.
- [c17] The method of claim 13, wherein updating data is performed with a incremental update protocol.
- [c18] The method of claim 13, wherein updating data is performed with a total update protocol.

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- [c19] The method of claim 15, wherein the plurality of services comprises a change sequence number service creating a unique combination of numbers used to determine ordering of an update operation for an attribute value in an entry in the directory information tree.
- [c20] The method of claim 13, wherein the plurality of services comprises an update resolution procedure service determining ordering of operations by comparing a first change sequence number of the supplier server to a second change sequence number of the consumer server.
- [c21] The method of claim 13, wherein the plurality of services comprises a replica update vector service determining a set of updates to be sent to a data replica by consulting a replica update vector for the consumer server.
- [c22] The method of claim 21, wherein the replica update vector comprises a change sequence number for every data replica.
- [c23] The method of claim 15, wherein the plurality of services comprises a replication agreement service comprising an entry in the directory information tree describing a relationship between the supplier server and the consumer server.
- [c24] The method of claim 13, wherein the plurality of services comprises a server-initiated replication protocol service to store and update state information.
- [c25] The method of claim 24, wherein state information comprises a uniqueid and a plurality of change sequence numbers for an entry.
- [c26] The method of claim 13, wherein the plurality of services comprises an incremental update algorithm service comparing a first replica update vector of the supplier server and a second replica update vector of the consumer server to order an update sequence from the change log.

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[c27] The method of claim 13, wherein the plurality of services comprises a uniqueid service assigning a unique identifier to an entry added by a client.

[c28] A method for replicating data in a directory server having a supplier and a consumer server, comprising:

determining a need to replicate data in the directory server;

using a plurality of services to manage replication of data contained within the directory server from the supplier server to the consumer server;

maintaining a change log of data replicated to the consumer server;

updating data replicated to the consumer server; and

resolving conflicts of the replicated data using a time stamp to determine the consumer server holding the most recent version of the replicated data.

[c29] An apparatus for replicating data in a directory server having a supplier and a consumer server, comprising:

means for determining a need to replicate data in the directory server;

means for using a plurality of services to manage replication of data contained within the directory server from the supplier server to the consumer server;

means for maintaining a change log of data replicated to the consumer server; and

means for updating data replicated to the consumer server.

FOOTNOTES